HOMICIDE RELATED TO CRIMES OTHER THAN DRUG TRAFFIC*

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ALTHOUGH my assigned topic is homicide related to crimes other than drug traffic, I shall focus primarily on homicides committed in conjunction with robberies. There are three reasons: Robbery murders are, by far, the most prevalent type of felony murder. Robbery murder has a large impact on the public's perception of violent crime in general. And more research has been done on robbery murders than other types.

My point of departure is national data on the characteristics of robbery murders. I shall contrast them with some data that I recently collected in Baltimore which suggests that the national data should be interpreted with extreme caution. Then I shall describe three studies of robbery murder that emphasize the following themes: Cities with large poverty populations have higher rates of homicide than do other cities. (This is especially true of felony homicides including robbery homicides.) Offenders who inflict injury during robberies are more likely to have a prior history of violent offenses than are offenders who do not inflict injury. And in Detroit between 1931 and 1979 the probability that a robbery would end in the death of the victim was closely related to the probability that the robbery would be committed with a gun rather than another weapon.

NATIONAL STATISTICS ON ROBBERY CIRCUMSTANCES

Most of what we know about nationwide patterns of homicide comes from the Uniform Crime Reporting System's Supplementary Homicide Report.

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TABLE I. DISTRIBUTION OF MURDER CIRCUMSTANCES, 1983, REPORTING AGENCIES IN THE UNITED STATES

Circumstances	*Frequency*	*Percent*
Felony type	3,364	18.0
Suspected felony type	592	3.2
Romantic triangle	482	2.6
Argument over money or property	532	2.8
Other arguments	6,374	34.1
Miscellaneous nonfelony type	3,418	18.3
Unable to determine	3,911	20.9
Total	18,673	100.0

Source: Crime in the United States—1983, p. 11.

These data, like the other Uniform Crime Report data, come from local law enforcement agencies who submit them to the FBI for tabulation and reporting. The most recent data from that source (1983) indicate that about 20% of the murders reported in the Supplementary Homicide Report were felony related. In another 20% the police were unable to determine the circumstance and the rest were not felony-related (Table 1). Within the felony category, robberies are the most frequent. At 60% of all felony killings, they are five times as prevalent as narcotics-related killings, six times as prevalent as sex offense killings and three times more prevalent than the miscellaneous category, "Other Felonies" (Table II).

One of the surprises in the felony homicide data is that in almost half (45%) of those that are classified victim and offender are not strangers. This is a biased estimate of the population of all felony killings since nonstranger killings are more likely to be classified, but even if we assume that all unclassified homicides occur between strangers (an unlikely state of the world) about 30% of felony killings occur in relationships where the victim and the offender know each other.

The FBI does not publish data specifically for robbery killings, but my 1983 Baltimore data indicate that friends and acquaintances are responsible for a sizeable proportion of robbery killings. Some of the Baltimore nonstranger robbery killings are accounted for by teenagers who know each other from school or neighborhood, but we found lovers and consanguineals who committed murders to take property.

This leads me to the question of the validity of the circumstances classifications in the Supplementary Homicide Reports. The data have been widely used, but there are no systematic studies of their error structure. The ma-

jor purpose of the study that we have just completed in Baltimore was to learn about the classification of robbery-murders and especially to evaluate the Supplementary Homicide Report classification procedures.

THE BALTIMORE STUDY: SUPPLEMENTARY HOMICIDE REPORTS REPLICATION

The methods used in the Replication Study[1] were simple. We obtained copies of the 12 monthly Supplementary Homicide Reports filed by the Baltimore Police Department during 1983. In addition, we obtained narrative summaries of the police investigations for the same year. Before examining the reports, we classified each of the 1983 Baltimore homicides with respect to the "circumstances" under which it occurred. This information, along with the Supplementary Homicide Report circumstance code and about 30 other characteristics of each homicide, were entered onto codesheets for analysis. There were 207 victims in the 1983 Report. Six of these were not included in the Replication Study because investigation reports could not be located, and five were omitted because the assault that eventually led to death did not occur in 1983.

Comparison of the distribution of murder circumstances in the national data (Table I) with the Baltimore distribution (Table III) indicates large differences not likely a result of local variation: 41% "felony type" in Baltimore, 18% nationally; 46% "undetermined" in Baltimore, 21% nationally; and 2% "other arguments" in Baltimore, 34% nationally.

More direct evidence on the reliability of the Supplementary Homicide Report data is the case-by-case comparison of the Report classification with the Replication Study classification. Table IV indicates that the consistency of the two classifications is surprisingly low. Of the 42 cases classified as "robbery," only 20 were classified as "robbery" in both studies.

One can increase the apparent reliability of the classification by excluding the "undetermined" cases. After all, these are not cases where an erroneous classification was made; they are cases where no classification was made. The problem with this is that the two studies vary widely on the cases that were classified as "circumstance undetermined." Only 24 of the 116 cases coded as undetermined in one study were coded this way by both (agreement in only 21% of the cases).

An examination of the inconsistently coded cases indicates three major reasons for the low reliability. Supplementary Homicide Report categories are mutually exclusive, so that a homicide cannot simultaneously fall into more

TABLE II. PERCENTAGE DISTRIBUTION OF TYPES OF FELONY MURDERS, 1983 SUPPLEMENTARY HOMICIDE REPORTS

Felony	*Percentage*
Robbery	59
Narcotics	11
Sex offense	9
Arson	4
Other felony	17

Source: Calculated from *Crime in the United States—1983*, p. 12

TABLE III. DISTRIBUTION OF MURDER CIRCUMSTANCES, 1983, BALTIMORE CITY SUPPLEMENTARY HOMICIDE REPORT

Circumstance	*Frequency*	*Percent*
Felony type	79	41.4
Suspected felony type	0	0.0
Romantic triangle	7	3.7
Argument over money or property	6	3.1
Other argument	4	2.1
Miscellaneous nonfelony type	6	3.1
Institution	2	1.0
Unable to determine	87	45.5
Total	191	100.0

Source: Unpublished Maryland Supplementary Homicide Report

than one category. It cannot, for example, be both robbery and narcotic-related. In reality, many homicides could be classified in more than one such circumstance category. The definition of "in conjunction" with a robbery is ambiguous. A distinction should be made between events motivated by robbery and those that have the behavioral elements of robbery. An example helps to make the point. In one Baltimore homicide, the victim's former lover broke into the home, killed the victim, and took the stereo and car. Clearly, robbery behavior occurred, but it is not at all clear that the incident was robbery-motivated. Many cases that could have been classified were treated as "undetermined" apparently in an attempt to be conservative in judging the circumstances. This increases the error, because all of the available information is not used.

This type of measurement error has a major impact on research conclusions. Consider the relationship between murder circumstance and solving (clearing) of cases by the police. Using the Report classification (Table V),

TABLE IV. REPLICATION STUDY CIRCUMSTANCE BY SUPPLEMENTARY HOMICIDE REPORT CIRCUMSTANCE

	Supplementary homicide report			
Replication sample	*Robbery*	*Not robbery*	*Undetermined*	*Total*
Robbery	20	9	5	34
Not robbery	2	49	58	109
Undetermined	6	23	24	53
Total	28	81	87	196

TABLE V. CLEARED CASES BY SUPPLEMENTARY HOMICIDE REPORT CLASSIFICATION OF CIRCUMSTANCE

	Circumstance			
	Robbery	*Not robbery*	*Undetermined*	*Total*
Cleared	82%	74%	70%	73%
	(23)	(60)	(61)	(144)
Not cleared	18%	26%	30%	27%
	(5)	(21)	(26)	(52)
Total	28	81	87	(196)

robbery homicides are slightly more likely to be cleared than other types of homicides (82% versus 74%). But, using the Replication Study's classification, the relationship reverses itself and is much stronger—robbery homicides are less likely to be cleared than other types (79% versus 94%), and homicides in "undetermined" circumstances have an especially low clearance rate (only 26%).

Baltimore is not a microcosm of America and it is not clear how accurate the Supplementary Homicide Reports are in other locations. At minimum, however, the data from the Reports should be used cautiously and the revision of the Uniform Crime Reporting System currently under way should adopt new procedures to enhance the validity of the circumstance classification.

POVERTY AND HOMICIDE

Having cautioned about the validity of the Supplementary Homicide Report murder circumstance categories, I ask your indulgence, at least tem-

porarily, while I use them. There is controversy in the sociological literature as to whether poverty is a risk factor in serious assaultive violence. The individual level data are generally supportive, but research using areal aggregates—states, cities—have produced inconsistent results. Some find the expected positive relationship, some find no relationship and one even finds a negative relationship.[2,3,4]

There are many problems associated with estimating behavioral models with aggregate data, but constraints on the availability of individual-level data make the analysis of aggregate data an irresistible enterprise. One reason for the inconsistency in the literature is that estimates are based on models that do not account for errors in income data. Technical literature, which I do not have time to summarize, suggests that the Census Bureau's estimates of poverty population are biased because they are based entirely on cash income and do not reflect variation in the cost of living or resources other than money income. Robert Nash Parker and I have developed a model to estimate the impact of poverty on city homicide rates which corrects for the bias in the census data by using the city's infant mortality rate as an "instrumental variable."[5]

The model is justified by the fact that the infant mortality rate is a well established correlate of poverty and is derived from a data collection system independent of and quite different from the census. No assumption is made that infant mortality rates cause homicide rates. The underlying causal model is that the percent of the population below the poverty line increases the homicide rate, but that infant mortality is correlated with the percent in poverty and that the errors in the model are not confounded with each other. If this is so, it can be shown that although a model using the Census Bureau's income based measure will be biased, the instrumental variable estimates will be consistent estimates. (I use the term "consistent" in the technical sense that the estimate will converge on the parameter in the probability limit.)

In estimating the model we use the 49 largest cities in the United States in 1970 and have divided homicides into several different circumstance categories based on the Supplementary Homicide Report. Tables VII and VIII summarize estimates of models for family homicides and robbery homicides. The independent variables include, in addition to the percentage of families below the poverty line: residential population of the city; density, proportion of units with more than one person per room; proportion of population between 18 and 24; proportion nonwhite; and region, a binary variable coded 1 for cities in the South.

TABLE VI. CLEARED CASES BY REPLICATION STUDY CLASSIFICATION OF CIRCUMSTANCE

	Circumstance			
	Robbery	*Not robbery*	*Undetermined*	*Total*
Cleared	79% (27)	94% (103)	26% (14)	72% (144)
Not cleared	21% (7)	6% (6)	74% (39)	27% (52)
Total	34	109	53	196

TABLE VII. MODEL FOR FAMILY HOMICIDE

	OLS estimates		*IV estimates*	
Independent variable	*Coefficient*	*Standard error*	*Coefficient*	*Standard error*
Constant	−1.711	1.607	−2.356	1.882
Poverty line	0.038	0.032	0.156*	0.078
Population	0.086	0.111	0.100	0.128
Density	−5.960*	2.646	−8.426*	3.362
Proportion nonwhite	1.440*	0.570	0.657	0.799
Age	−0.613	0.507	−0.437	0.591
Region	0.429	0.238	−0.031	0.383
R^2	0.3253		0.1111	

*$p \leq 0.05$

TABLE VIII. MODEL FOR ROBBERY HOMICIDE

	OLS estimates		*IV estimates*	
Independent variable	*Coefficient*	*Standard error*	*Coefficient*	*Standard error*
Constant	−8.419*	3.712	−10.196*	4.564
Poverty line	0.125	0.074	0.449*	0.189
Population	0.545*	0.257	0.584	0.311
Density	−10.603	6.115	−17.396*	8.153
Proportion nonwhite	5.186*	1.318	3.030	1.937
Age	−0.698	−1.170	−0.212	1.432
Region	−0.400	0.549	−1.666	0.928
R^2	0.4788		0.2437	

*$p \leq 0.05$

On the left-hand side of the tables you will find the conventional (OLS) regression estimates that we argue are biased. The estimates based on the instrumental variable model are on the right-hand side. The instrumental variable estimates radically alter the conclusions that would be drawn from the analysis. Relying on the OLS estimates, one would conclude that while relationships are positive, they are not significantly different from zero and should not be interpreted as evidence that poverty increases the risk of homicide. The instrumental variable estimates are 250% to 300% larger than the OLS estimates and are both statistically significant. The data are clearly consistent with a model in which the size of a city's poor population influences the risk of homicide and, if the size of our estimates are reliable, the effect is much greater for robbery homicide than it is for family homicides.

Violent Criminal Careers and Injury in Robbery

The third investigation returns us to the solid footing of individual-level data. Robbery is both a property crime and a violent crime, since it involves the taking of property by force or the threat of force. One of the fundamental issues in the study of robbery murder, therefore, is the determination of the conditions that convert a simple no-injury robbery into a robbery in which the victim is injured or killed. Analytically we can distinguish situational factors and relatively enduring characteristics of robbers. The third study investigates the relationship between the risk of serious injury to robbery victims and characteristics of robbers' prior criminal careers.[6] The results are tentative, but they suggest that robbers who begin committing violent offenses when they are juveniles are more likely to injure their victims than are other robbers.

The estimates are based on a retrospective or "case-control" study in Detroit, Michigan. Practical considerations dictate the design. Since robberies with injury are rare events, a prospective study would be inordinately expensive. The case-control design makes efficient use of resources and, under reasonable conditions, will produce unbiased estimates of the effects of independent variables. The samples were drawn from a file prepared for a study of the effect of the Michigan Felony Firearm Law on felonies processed in the Detroit Recorder's Court during 1976-1978.[7] I sampled from two strata: injury robberies, armed robberies where the victim was injured by the defendant, and simple robberies, armed robberies where no victim was injured.

All black male injury-robbery defendants and a random sample of the black male simple robbery were selected for analysis. Following epidemiologic ter-

TABLE IX. RELATION BETWEEN INJURY OF VICTIM IN ROBBERY AND NUMBER OF VIOLENT JUVENILE AND ADULT OFFENSES OTHER THAN ROBBERY

A) Frequencies

Violent adult and juvenile offenses	*Degree of injury to victim*				
	Death	*Serious*	*Minor*	*None*	*Total*
Two or more	5	5	2	11	23
One	9	10	14	41	74
None	27	33	64	187	311
Total	41	48	80	239	408

B) Estimated Relative Risks of Injury Associated With Offender Having Two or More Prior Violent Juvenile And Adult Offenses Other Than Robbery–

Risk Of:	*Estimated RR†*	*Chi-square‡*	*P-Value*
Death	3.148	3.453	0.063
Death or serious injury	2.833	4.879	0.027
Death, serious, or minor injury	1.645	1.318	0.251

*Reference group is no prior violent adult offenses.
†In each case the contrast is with no injury.
‡Based on model of independence.

minology, I refer to the injury robbery sample as "cases" and the simple robberies as "controls." Information on criminal careers came from presentence investigation reports compiled by the probation officers assigned to Recorder's Court.

Table IX illustrates the mode of analysis. The relative risk (RR) is estimated using the odds ratio calculated from a 2 × 2 partition of the data. For example, contrasting death of the victim with no injury, we estimate that the victims of robbers who have a prior history of assaultive violence (in this case, two or more prior violent juvenile and adult offenses other than robbery) are three times more likely to be killed than the victims of robbers without a history of assaultive violence.

Multivariate analysis can be conducted via a logistic regression model. The antilog of the coefficients in the model can be interpreted as estimates of the relative risk. Table X summarizes the results of 18 models in which we

TABLE X. LOGISTIC REGRESSION ESTIMATES OF EFFECT OF PRIOR RECORD ON INJURY OF VICTIM IN ROBBERY, CONTROLLING FOR AGE AND USE OF GUN†

	Minor injury		*Serious injury*		*Death*	
	Coeff.	*Ratio†*	*Coeff.*	*Ratio*	*Coeff.*	*Ratio*
	Number of violent adult offenses					
Age						
< 20	0.331	1.224	0.459	1.412	0.629	1.399
20-24	−0.221	−0.880	−0.240	−0.762	0.035	0.082
Gun	−0.741	−3.368*	−0.323	−1.165	0.289	0.677
Priors	−0.035	−0.304	−0.047	−0.332	0.127	0.755
	Number of violent juvenile offenses					
Age						
< 20	0.310	1.182	0.368	1.162	0.318	0.723
20-24	−0.216	−0.873	−0.243	−0.782	−0.055	−0.130
Gun	−0.761	−3.463*	−0.356	−1.282	0.251	0.587
Priors	0.109	0.849	0.241	1.745	0.340	2.247*
	Number of violent juvenile and adult offenses					
Age						
< 20	0.367	1.421	0.525	1.701	0.612	1.424
20-24	−0.199	−0.798	−0.188	−0.601	0.076	0.177
Gun	−0.757	−3.429*	−0.361	−1.294	0.211	0.488
Priors	0.030	0.343	0.101	1.028	0.262	2.259*
	Number of violent adult offenses other than robbery					
Age						
< 20	0.350	1.360	0.479	1.614	0.530	1.253
20-24	−0.210	−0.849	−0.220	−0.710	−0.015	−0.037
Gun	−0.743	−3.388*	−0.332	−1.201	0.308	0.724
Priors	−0.090	−0.383	0.016	0.581	0.140	0.432
	Number of violent juvenile offenses other than robbery					
Age						
< 20	0.260	0.996	0.323	1.017	0.395	0.910
20-24	−0.203	−0.819	−0.213	−0.682	0.001	0.003
Gun	−0.764	−3.467*	−0.320	−1.142	0.324	0.753
Priors	0.552	2.117*	0.776	2.657*	0.779	2.228*
	Number of adult and juvenile offenses other than robbery					
Age						
< 20	0.332	1.288	0.446	1.437	0.469	1.093
20-24	−0.201	−0.810	−0.193	−0.617	0.009	0.020
Gun	−0.769	−3.493*	−0.349	−1.253	0.278	0.650
Priors	0.228	1.404	0.394	2.162*	0.481	2.200*
n	400		323		276	

† In each model the response variable is a contrast between the noted level injury and no victim injury.
‡ Ratio of coefficient to its standard error.
* Significant at 0.05 level or beyond.

control for the age of the offender and whether or not a gun was used in the robbery. The last row in each model which is labeled "priors" is the criminal history variable. There is a separate analysis for minor injury, serious injury and murder. The independent variables vary by whether juvenile or adult offenses are counted and whether or not we include robbery as a violent offense.

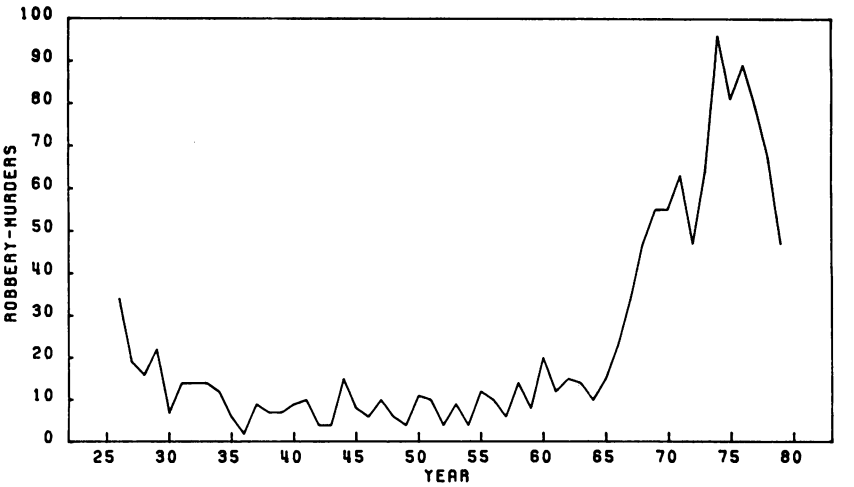
A violent juvenile record, especially for offenses other than robbery, is associated with a significent increase in the risk of injury in robbery. The fifth panel of Table X is the one that contains most suggestive results. If the estimates are approximately correct, they indicate that each violent offense (excluding robbery) committed as a juvenile doubles the risk that robbery victims will be seriously injured or killed.

I do not know why the effects are strongest for juveniles, but one possibility is that the data on juvenile offenses are more accurate. This is consistent with subjective impressions gained from reading the presentencing investigations. It is also interesting that the effects are strongest for violent offenses other than robbery. One interpretation of this is that robbery is primarily a property offense and is practiced by offenders who are not violence-prone. All of this is consistent with a model in which juvenile violence exerts a direct causal influence on victim injury in robbery, but one should interpret the results cautiously. This is so because of possible bias in the estimates, and because theoretical models that would interpret the results are at a primitive stage of development.

Firearms and Robbery-Murder

The final study is a time-series analysis of the relationship between robbery killings and the proportion of robberies committed with a gun in Detroit between 1931 and 1979.[8] If the subject evokes *deja vu*, this is appropriate because in 1977 Franklin Zimring published an influential study of robbery killings in Detroit for the 13-year period from 1962 through 1974.[9] The study that I describe revisits Detroit robbery killings and extends Zimring's analysis in three ways. First, the time period is extended from 13 to 49 years; second, demographic variables that were not available to Zimring are added; and, third, the analysis is conducted within a multivariate framework so that the effects of variables can be evaluated simultaneously.

Figure 1 is the Detroit robbery-murder time series for the period 1926-1979, and Table XI is a representative example of the various models that we estimated. It includes the following variables: robberies per 100,000 residents; proportion of robberies with a gun; proportion of robberies with other weapons (unarmed robberies are excluded); proportion of the population be-



Detroit robbery-murders (1926-1979)

tween 15 and 34 years of age; proportion of the population nonwhite; and a dummy variable for the World War II period. All variables except World War II are expressed as natural logarithms.

This particular analysis is a strong test for the model in which the use of a gun increases the risk of victim death in robbery, because it includes both the proportion of robberies with a gun and the proportion of robberies with other weapons. Since the two variables are highly correlated, we can expect the estimates to be somewhat degraded by collinearity.

Nevertheless, the results are quite consistent with the model. The robbery murder rate rises with the robbery rate and the proportion of robberies committed with a gun and declines with the proportion of robberies committed with other weapons. The proportion of robberies with a gun is not statistically significant at the 0.05 level in this model, but it was significant in all specifications except the ones that include the proportion with other weapons, and the one-tail probability value is quite small (0.09).

Concluding Comments

Although this research is diverse in topic, method and type of data, it is stitched together by a search for factors which increase the risk of robbery murder. It is useful to conclude by enumerating the factors that have been identified. They are a large proportion of the population poor; offenders who have prior history of assaultive violence, especially a history that begins as a juvenile; and the use of a gun rather than some other weapon.

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